

MEMORANDUM

August 7, 2020

To: Chris Dulaba

Organization: Beljan Development Management

From: Ryan Batty and Tyler Golly

Project: The Hive High-Rise Development

Re: Parking and Transportation Impact Assessment

Background, Site Location, and Current Context

Toole Design was retained by Beljan Development Management to complete a Parking and Transportation Impact Assessment in support of a DC2 application for the development of a high-rise residential tower in the Garneau neighbourhood. The proposed development would replace an existing surface parking lot with a residential high-rise development consisting of 271 units.

To evaluate the impact of the proposed development on existing parking supply, transportation operations, and traffic circulation within the area, the City of Edmonton has requested a Parking and Transportation Impact Assessment. This study provides details to City staff and Garneau residents about the development and the anticipated parking demand, and how the proposed development will accommodate this demand.

In addition, the study includes a review of the existing alley connection between 109 Street and 108A Street and the alley paralleling 109 Street east of the existing commercial development. These alleys will be used for access to the underground parking associated with the proposed development. These alleys currently serve a similar function for developments in the area, providing access to the underground and surface parking for the high-rise development located immediately north of the proposed development and the commercial properties located along 109 Street.

Finally, based on site observations, use of existing traffic volume counts, and projections for transportation demands from the proposed development, a review was completed to assess multimodal traffic circulation during periods of peak demand.

A map of the study area is shown in Figure 1 on the next page.

The Hive is located in an area within Garneau that includes medium- and high-density residential buildings as well as commercial retail land uses. Commercial land uses are predominantly located along 109 Street. Higher density residential land uses are located along Saskatchewan Drive, including the parcel immediately to the north of the proposed development site. The site has direct access to an east-west alley to the north of the site, a north-south alley to the west of the site, and 108A Street to the east of the site. The alleys provide access to 109 Street and 86 Avenue. 86 Avenue provides access to 109 Street and 108A Street and 86 Avenue provide access to local destinations within the Garneau and Strathcona Neighbourhoods. Unrestricted on-street parking is currently allowed along one side of both 108A Street and 86 Avenue.

however, transportation impacts were assessed in two ways consistent with the “Traffic Memo” level of transportation assessment identified in the City of Edmonton’s *Transportation Impact Assessment Guidelines*:

1. Multimodal trip generation, trip assignment to the street network, and evaluation of volume and capacity on the streets providing access/egress to the proposed development; and
2. Evaluation of multimodal operations and circulation patterns in the alleys adjacent to the proposed development and intersections.

The connectivity of the development with the following intersections and the capacity of the following streets were considered in this study:

- Intersections (basic operational observational review):
 - 109 Street and 87 Avenue
 - 109 Street and 86 Avenue
 - 109 Street and East/West Alley
 - 108A Street and East-West Alley
 - East-West Alley and North-South Alley
 - 108A Street and 86 Avenue
- Streets (volume and capacity analysis):
 - 108A Street
 - 86 Avenue
 - 109 Street

Proposed Development

The proposed development, called “The Hive,” is proposed to include the following:

- Maximum of up to 271 Residential Units, that were evaluated based on the following mix:
 - 90 studio units
 - 129 one-bedroom units
 - 38 two-bedroom units
 - 14 three-bedroom units
- Parking:
 - 23 surface parking stalls that will be used for short term purposes and operate as shared parking
 - 1 surface loading stall
 - 66 underground parking stalls (for residents)
 - Minimum of 6 accessible/barrier-free parking stalls underground
 - Minimum of 185 long term underground bicycle parking (for residents)
 - Minimum of 14 short term bicycle parking (for visitors) that are public accessible

Existing Traffic Volumes, Site Visits, and Current Circulation Patterns

Site visits were completed during the morning and afternoon peak hours to assess existing traffic patterns and circulation around the proposed development site. The time of the site visits were selected based on the peak hours observed during traffic counts completed by the City of Edmonton at the following locations and the desire to observe circulation and operations during these periods.

Table 1: Summary of Peak Hours from City of Edmonton Street and Intersection Traffic Counts

Location/Count (date)	AM Peak Hour	AM Peak Volume	PM Peak Hour	PM Peak Volume
109 Street North of 86 Avenue (June 2015)	7:25 to 8:25	2,550	4:00 to 5:00	2,675
109 Street North of 86 Avenue (October 2015)	7:35 to 8:35	2,667	5:00 to 6:00	2,862
87 Avenue & 109 Street Intersection (October 2017)	8:00 to 9:00	2,430 (Link volume along 109 St south of 87 Ave)	4:40 to 5:40	2,758 (Link volume along 109 St south of 87 Ave)
86 Avenue & 109 Street Intersection (October 2015)	7:45 to 8:45	2,664 (Link volume along 109 St north of 86 Ave); 2,576 (Link volume along 109 St south of 86 Ave); 95 (Link volume along 86 Ave east of 109 St)	5:00 to 6:00	2,862 (Link volume along 109 St north of 86 Ave) ; 2,800 (Link volume along 109 St south of 86 Ave); 130 (Link volume along 86 Ave east of 109 St)
86 Avenue West of 108A Street (October 2015)	8:05 to 9:05	101	3:30 to 4:30	148
86 Avenue West of 109 Street (October 2015)	8:05 to 9:05	105	5:15 to 6:15	96

The site visits and observations were completed on Monday April 8, 2019 during the following periods and under the noted weather conditions. Figure 2 illustrates the area observed and a sample of site observations. The site visits were completed by one staff and included walking the area and observing operations and patterns at the locations noted in the figure. The intent of the site observations was to better understand circulation and use patterns and was not intended to collect traffic volumes or turning movement counts as those exist from previous counts completed by the City of Edmonton.

- 7:30AM to 8:30 AM - At the time of the site visit the temperate was 4°C, conditions were clear and sunny.
- 4:00PM to 5:30PM - Conditions were clear and sunny during the site visit and the temperature was 15°C.



Figure 2 - Area Observed and Site Observations

The following is a summary of the observations from these site visits. Figure 3 summarizes the circulation patterns for people using each mode.

Vehicle Trips and Circulation

To review the current operation of the alleys and streets near the proposed development, a summary of the typical characteristics for each street type was prepared. From the Transportation Association of Canada's *Geometric Design Guide for Canadian Roads*, the City of Edmonton's *Transportation Impact Assessment Guidelines*, and Edmonton's current and soon-to-be implemented posted speed limits, the following highlights the typical characteristics of the streets within the study area:

- Alleys: motor vehicle capacity up to 1000 vehicles per day. Speed limits for alleys in Edmonton is 20 km/h.
- Local Streets: motor vehicle capacity is typically up to 1,000 for residential local streets and up to 3,000 for commercial local streets. Residential streets in Edmonton, including local streets such as 108A Street, will be posted to 40 km/h based on recent City Council direction and bylaw changes.
- Collector Streets: motor vehicle capacity is typically up to 8,000 vehicles per day with 2-lane collector streets having a typical of 5,000. Speed limits along collector streets in Edmonton in the Garneau and Strathcona neighbourhoods will be 40 km/h based on recent City Council direction.
- Arterial Streets: motor vehicle capacity ranges from 10,000 to 60,000 vehicles per day and is highly dependent on the number of lanes provided and intersection controls, with a 4-lane undivided arterial

street can typically accommodate up to 20,000. Speed limits for arterial streets vary in Edmonton depending on the location and land use context. 109 Street is currently posted as 50 km/h.

East-West and North-South Alleys

- During the AM and PM peak periods, the observed volume of vehicle traffic in the alleys was low; typically averaging a vehicle every two or three minutes.
- Vehicle speeds in the alleys were low and consistent with what would be expected given the context of the roadway.
- During the AM peak period, vehicle trips consisted predominantly of outbound trips from the existing adjacent residential tower and residential developments and were distributed evenly between westbound trips towards 109 Street and eastbound trips to 108A Street. Vehicle traffic in the north/south alley was very low during the AM peak period.
- Vehicle patterns were reversed during the PM peak period with most trips observed as inbound trips to the existing residential and commercial properties. During this period, most of the trips were observed coming from 108A Street and the north/south alley. The traffic observed in the north/south alley is likely the result of return vehicle trips from downtown turning left from 109 Street onto 86 Avenue and then left into the north/south alley as turns from 109 Street to the east/west alley are prohibited.
- No congestion within the east/west alley was noted but short delays were observed for vehicles turning from the east/west alley onto northbound 109 Street northbound. For these vehicles, a signal change at the 109 Street/87 Avenue intersection often provided the gap in traffic necessary to access 109 Street.
- Two vehicles were observed driving through the commercial parking lot west of the proposed development to access the 87 Avenue intersection where a left turn onto 109 Street southbound is permitted.

108A Street

- On-street parking was heavily used during the AM and PM peak hour. As expected for a street serving primarily residential uses, there was little parking turnover observed during the peak periods.
- During the AM peak period, the majority of vehicle trips on 108A Street were northbound and originate from the vehicles parked on the street.
- Vehicle patterns in the PM peak period were also primarily northbound with destinations along 108A Street and the residential parking areas to the north.

86 Avenue

- Vehicle trips on 86 Avenue were primarily westbound towards 109 Street during the AM peak period. This pattern was reversed during the PM peak period.
- On-street parking utilization was near capacity at the beginning of the AM peak period.

109 Street

- During the AM peak period, the majority of vehicle trips on 109 Street were northbound; this is consistent with the function of 109 Street as an arterial roadway providing access to downtown. This travel pattern was reversed during the PM peak period, with the majority of vehicle trips travelling southbound.

Walking and Biking Trips and Circulation

- During the AM and PM peak periods, the observed volume people walking and biking in the alleys was approximately equal to the volume of vehicle traffic.
- People walking in the alley were noted to be mostly westbound in the morning and eastbound in the afternoon. During the AM peak period site visit, a number of people were observed walking through the east/west alley with small children, using the alley as a route to Garneau School.

- Also observed during the morning and afternoon site visits were a number of people accessing the alley from the east, along the rail/streetcar alignment. There is currently no trail in this area, but the route provides a connection from 107 Street and 108 Street to 109 Street. For people walking, this could be a less circuitous route than using 86 Avenue for trips to/from 109 Street. Strathcona and Garneau Neighbourhood Renewal will be adding a shared-use path along this alignment.
- People biking in the alley were observed using 108A Street and the east/west alley to access 109 Street during the morning site visit. In the afternoon, most of the bicycle activity in the area was in the reverse direction of what had been observed in the morning, indicating this is being used as a route for commuter cyclists.
- Changes and additions to the bicycle and pathway networks as part of Neighbourhood Renewal may shift travel patterns in the future, for example with the addition of a protected bikeway along 110 Street.



Figure 3 - Summary of Observed Circulation Patterns

Transportation Capacity Assessment

Using insights obtained from the site visits and desire lines observed, based on existing infrastructure, the likely routing and circulation for each user type—vehicle, bicycle, and pedestrian—was identified. . The circulation and operations observations are used as an input to the transportation capacity assessment documented below.

Trip Generation & Mode Split

Using the City of Edmonton 2013 Trip Generation Rates – Residential Land Uses outlined in the City's *Transportation Impact Assessment Guidelines*, the proposed development can be expected to generate the following total number of trips made by all modes based on an apartment-style land use for a RA7 or RA8

equivalent. Also included in the analysis is the trip rate from the Institute of Transportation Engineers' (ITE) *Trip Generation Manual* (10th Edition) for Multifamily Housing (High-Rise), Land Use 222. The daily trip rate for RA7/RA8 in the City's *Transportation Impact Assessment Guidelines* is also taken from the ITE Manual for Land Use 230.

Table 2: Trip Generation Rates

<i>Land Use Type</i>	# of Proposed Dwelling Units	Time Period	Trip Rate (trips per dwelling unit)	# of Trips
<i>RA7 & RA8 – Apartment Housing</i>	271	AM Peak Hour	0.34	93
		PM Peak Hour	0.40	109
		Daily	5.81	1,575
<i>Multifamily Housing (High-Rise)</i>	271	AM Peak	0.21	57
		PM Peak	0.20	55
		Daily	2.07	562

Based on the density of the proposed development, we recommend using the ITE-based Multifamily Housing (High-Rise) as the basis for the transportation capacity assessment. The rate is for motor vehicle traffic and is based on data collected from high-rise residential developments in urban core locations with proximity to transportation options such as high frequency transit, bicycle facilities, and destinations within walkable (400 to 800 m) distances. As such, further trip reductions to account for mode split based on increased transit ridership, walkability, bikeability, and travel demand management are not required.

Trip Distribution

Trip distribution from the proposed development will follow typical patterns as exhibited by the turning movement counts collected at the 86 Avenue and 109 Street intersection. The following figures illustrate the turning movement counts collected by the City of Edmonton on October 22 and 23, 2015 at the intersection.

From the west leg of the intersection (i.e., east approach), the following trip distribution patterns are observed (assuming 0% westbound through as it is a very small number in the AM and PM peak periods).

Table 3: Trip Distribution

Peak Period	To/From North	To/From South
AM Peak	73% (42 trips)	27% (15 trips)
PM Peak	69% (38 trips)	31% (17 trips)
Daily	63% (354 trips)	37% (208 trips)

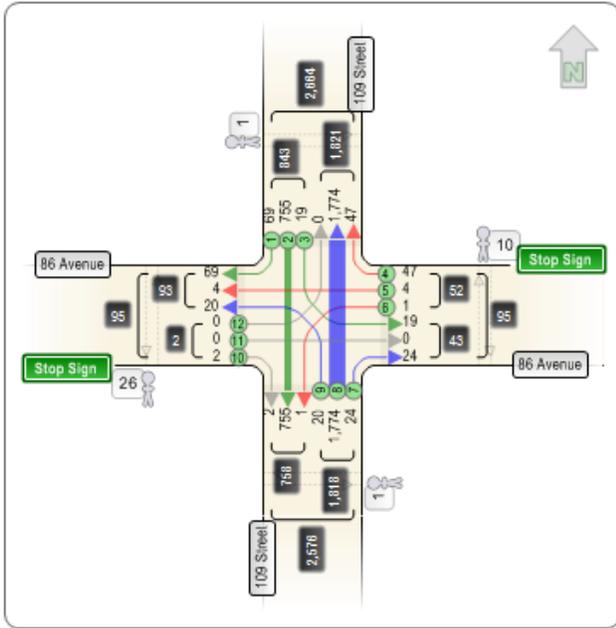


Figure 4 - AM Peak Hour Count for 86 Avenue & 109 Street Intersection (Source: City of Edmonton)

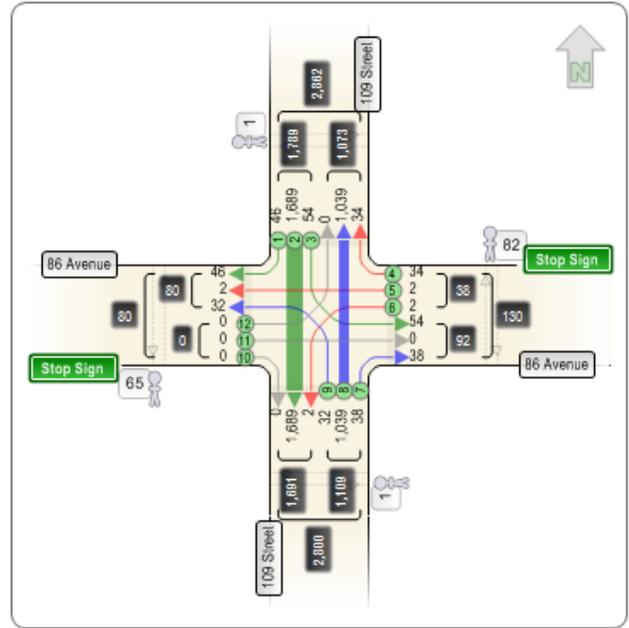


Figure 5 - PM Peak Hour Count for 86 Avenue & 109 Street Intersection (Source: City of Edmonton)

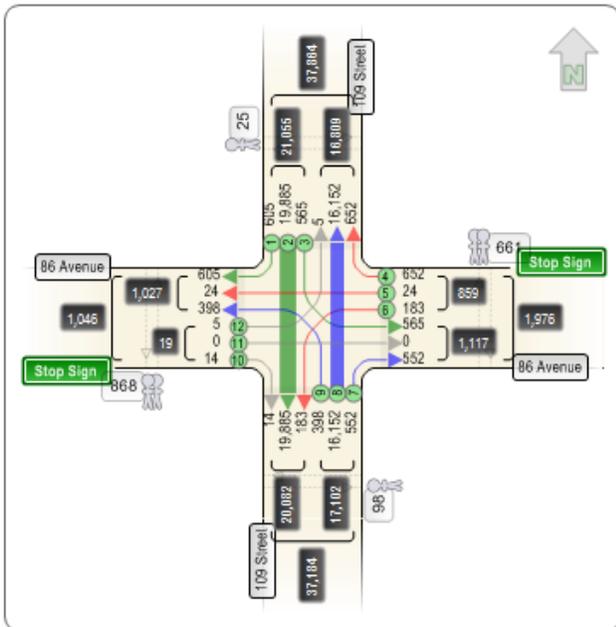


Figure 6 - Estimated 24 Hour Count for 86 Avenue & 109 Street Intersection (Source: City of Edmonton)

Trip Assignment

For residents of the proposed development who choose to own a vehicle, access to the underground parking will be via the north/south alley via the southeast corner of the proposed development. Surface parking stalls for visitors and accessory parking designated for use by the adjacent commercial properties to the west of the site

will be located on the west side of the development under the second floor of the building. There is also a loading stall located adjacent to the underground parking ramp on the west side of the building with access to the north/south alley. Finally, there is on-street parking along 108A Street that could be used for visitors as well, but site observations confirmed this unrestricted parking is typically well-used and has limited capacity for visitors of the proposed development.

The location of the underground parking and surface parking/loading will require most trips generated by the development to use the north/south alley along the west side of the proposed building for at least a portion of the person's journey. It is expected that the trips generated by the proposed development will use the alleys and roadways in patterns consistent with what was observed during the site observations. Most of the motor vehicle trips from the proposed development will originate and terminate in the north/south alley in order to access the underground parking for residents and surface parking for visitors accessed. To/from the north/south alley, residents, visitors, and deliveries can use a combination of the east/west alley, 86 Avenue, 108A Street, 109 Street, and 107 Street depending on where the person is travelling to or from. The following Tables document the assumed percent and number of trips that are assigned to each link in the network while Figure 7 illustrates the assignment of motor vehicle trips associated with the proposed development.

Table 4: Trip Assignment – AM Peak

Trips Along	Trips To/From North	Trips To/From South	Total Assigned Trips
North/South Alley (north of site)	80% (34 trips)	0%	34 trips
North/South Alley (south of site)	20% (8 trips)	100% (15 trips)	23 trips
East/West Alley (west of North/South Alley)	80% (34 trips)	0%	34 trips
East/West Alley (east of North/South Alley)	0%	0%	0 trips
108A Street	0%	0%	0 trips
86 Avenue (west of North/South Alley)	5% (2 trips)	100% (15 trips)	17 trips
86 Avenue (North/South Alley to 108A Street)	15% (6 trips)	0%	6 trips
86 Avenue (east of 108A Street)	15% (6 trips)	0%	6 trips
109 Street (north of 86 Avenue)	5% (2 trips)	0%	2 trips
109 Street (south of 86 Avenue)	0%	100% (15 trips)	15 trips
107 Street (north of 86 Avenue)	15% (6 trips)	0%	6 trips
107 Street (south of 86 Avenue)	0%	0%	0 trips
Total Generated Trips (11% inbound & 89% outbound)	42 trips	15 trips	57 trips

Table 5: Trip Assignment – PM Peak

Trips Along	Trips To/From North	Trips To/From South	Total Assigned Trips
North/South Alley (north of site)	20% (7 trips)	5% (1 trip)	8 trips
North/South Alley (south of site)	80% (29 trips)	95% (18 trips)	47 trips
East/West Alley (west of North/South Alley)	0%	0%	0
East/West Alley (east of North/South Alley)	20% (7 trips)	5% (1 trip)	8 trips
108A Street	20% (7 trips)	5% (1 trip)	8 trips
86 Avenue (west of 108A Street)	80% (29 trips)	100% (19 trips)	48 trips
86 Avenue (North/South Alley to 108A Street)	0%	5% (1 trip)	1 trip
86 Avenue (east of 108A Street)	20% (7 trips)	0%	7 trips
109 Street (north of 86 Avenue)	80% (29 trips)	0%	29 trips
109 Street (south of 86 Avenue)	0%	100% (19 trips)	19 trips
107 Street (north of 86 Avenue)	20% (7 trips)	0%	7 trips
107 Street (south of 86 Avenue)	0%	0%	0 trips
Total Generated Trips (66% inbound & 34% outbound)	36 trips	19 trips	55 trips

Table 6: Trip Assignment – Daily

Trips Along	Trips To/From North	Trips To/From South	Total Assigned Trips
North/South Alley (north of site)	40% (142 trips)	10% (21 trips)	163 trips
North South Alley (south of site)	60% (212 trips)	90% (188 trips)	400 trips
East/West Alley (west of North/South Alley)	30% (106 trips)	0%	106 trips
East/West Alley (east of North/South Alley)	10% (36 trips)	10% (21 trips)	57 trips
108A Street	10% (36 trips)	10% (21 trips)	57 trips
86 Avenue (west of 108A Street)	50% (177 trips)	85% (177 trips)	354 trips
86 Avenue (North/South Alley to 108A Street)	10% (36 trips)	5% (10 trips)	46 trips
86 Avenue (east of 108A Street)	20% (71 trips)	15% (32 trips)	103 trips
109 Street (north of 86 Avenue)	50% (177 trips)	0%	177 trips
109 Street (south of 86 Avenue)	0%	85% (177 trips)	177 trips
107 Street (north of 86 Avenue)	20% (71 trips)	0%	71 trips
107 Street (south of 86 Avenue)		15% (32 trips)	32 trips
Total Generated Trips (50% inbound & 50% outbound)	354 trips	208 trips	562 trips

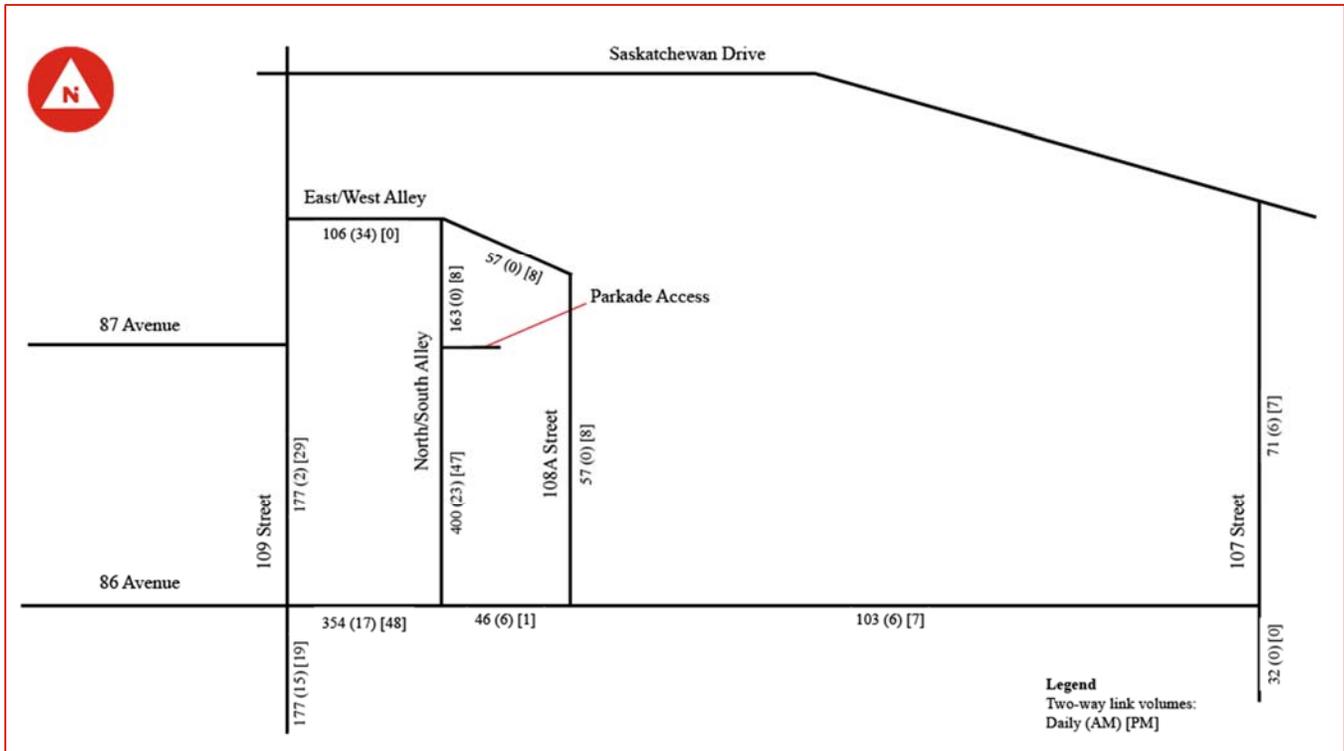


Figure 7 - Trip Assignment for Motor Vehicle Trips from the Proposed Development

Motor Vehicle Capacity Assessment & Infrastructure Needs

Table 7 summarizes the assessment of motor vehicle capacity on the streets and alleys that provide access to the proposed development. The existing and future total motor vehicle volumes are illustrated in Figure 8. Where traffic counts are available, the percent of the site generated traffic from the total traffic volume on each street is calculated. Where traffic counts are not available, the site generated motor vehicle traffic is expressed as a percentage of the typical capacity of the roadway based on City of Edmonton and Transportation Association of Canada volume thresholds.

Table 7: Capacity Assessment

Road Segment	Existing Volumes OR Capacity	Site Generated Volumes	Total Volumes (Existing + Site)	% Increase OR % of Capacity
North/South Alley (north of site)	Capacity: 1,000 vpd	Daily: 163	N/A	16% of Capacity
North/South Alley (south of site)	Capacity: 1,000 vpd	Daily: 400	N/A	40% of Capacity
East/West Alley (west of North/South Alley)	Capacity: 1,000 vpd	Daily: 117	N/A	12% of Capacity
East/West Alley (east of North/South Alley)	Capacity: 1,000 vpd	Daily: 57	N/A	6% of Capacity

108A Street	Capacity: 1,000 vpd	Daily: 47	N/A	5% of Capacity
86 Avenue (west of 108A Street)	AM Peak: 101 PM Peak: 148 Daily: 1,974	AM Peak: 17 PM Peak: 48 Daily: 354	AM Peak: 118 PM Peak: 196 Daily: 2,328	AM: 14% of total PM: 24% of total Daily: 15% of total
86 Avenue (east of 108A Street)	Capacity: 1,000 vpd	Daily: 92	N/A	9% of Capacity
109 Street (north of 86 Avenue)	AM Peak: 2,664 PM Peak: 2,862 Daily: 37,864	AM Peak: 2 PM Peak: 29 Daily: 177	AM Peak: 2,666 PM Peak: 2,891 Daily: 38,041	AM: 0% of total PM: 1% of total Daily: 5% of total
109 Street (south of 86 Avenue)	AM Peak: 2,576 PM Peak: 2,800 Daily: 37,184	AM Peak: 15 PM Peak: 19 Daily: 177	AM Peak: 2,591 PM Peak: 2,819 Daily: 37,361	AM: 1% of total PM: 1% of total Daily: 0% of total
107 Street (north of 86 Avenue)	AM Peak: 69 PM Peak: 93 Daily: 867	AM Peak: 6 PM Peak: 7 Daily: 71	AM Peak: 75 PM Peak: 100 Daily: 938	AM: 8% of total PM: 7% of total Daily: 8% of total

Note: vpd = vehicles per day

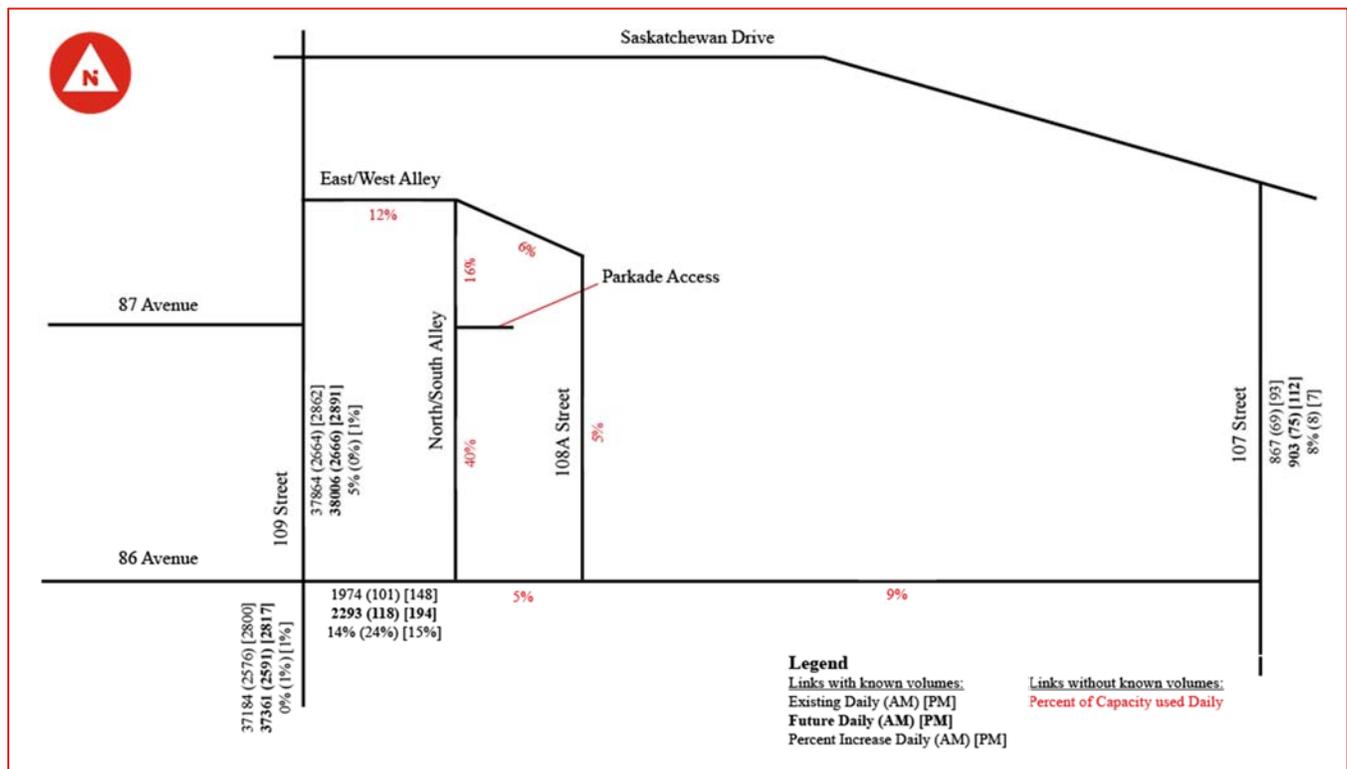


Figure 8 - Existing and Future Traffic Volumes (AM, PM, and Daily)

As can be seen from the above table, the site generated traffic represents a small percentage of the total motor vehicle traffic volumes along 86 Avenue, 109 Street, and 107 Street. Where traffic volumes are not available, the site generated traffic represents a small percentage of the total motor vehicle capacity for the local streets and alleys. The north/south alley south of the proposed development is the location with the highest cumulative traffic volumes and represents approximately 40% of the capacity of the alley. Based on the small increase in motor vehicle volumes, none of the streets that provide access to the property will be significantly impacted or have their capacities exceeded due to the added traffic volumes generated from the proposed development.

Based on the circulation and volumes observed during the site visits and the analysis presented above, the added motor vehicle volumes can be accommodated with the existing infrastructure capacity and traffic controls.

Active Transportation Infrastructure

Most people are willing to walk at least five to 10 minutes at a comfortable pace to reach a destination (typically considered a distance of 400 m to 800 m for an average adult). In the context of walking trips generated by the proposed development, this makes the 109 Street corridor a likely destination for most trips. This is consistent with what was observed during site visits, with the east/west alley being used by people walking to access 109 Street during the morning and then traveling from 109 Street through the alley in the afternoon. 109 Street is also an important walking destination because of its current and future high frequency transit service. People living and visiting the proposed development that are arriving by transit will likely follow a walking path that includes 109 Street and the east/west alley.

For people biking, the University of Alberta, Downtown, and Old Strathcona areas are all easily accessible for people working or studying in these areas of the city. MacEwan University, Bonnie Doon Mall, and Southgate Mall are all within approximately 15 minutes (i.e., 3 to 4 km) from the proposed development by bike.

There has been and continues to be significant investment in active transportation infrastructure within the walkshed and bikeshed of the proposed development. The 83 Avenue major bikeway, the 76 Avenue and 106 Street protected bike lanes, and the Downtown Bike Grid are all in place for cycling. Neighbourhood Renewal for the Garneau and Strathcona neighbourhoods is also reconstructing sidewalks and shared-use paths, improving intersection safety, adding traffic calming, and installing all ages and abilities bike facilities. The residential speed limits are also soon to be reduced to 40 km/h to further enhance the safety and comfort of the neighbourhood streets for walking, cycling, and accessing transit.

Based on review of the proposed walking and cycling facilities in Garneau's Neighbourhood Renewal plan and the facilities that are under construction in Strathcona, the ability for residents and visitors of the proposed development to access area schools, jobs, shopping, and cultural destinations will be supported. The primary element that needs to be coordinated is the design of the east/west alley. This link will connect to a shared-use path to the east along the rail/streetcar line and is a known walking and cycling connection today. The design of this alley should be coordinated between Beljan and the City of Edmonton to create a "shared space" or "shared street" similar to the active alley approach being taken to alleys in the Old Strathcona Business Area and Downtown. From the City of Edmonton's *Complete Streets Design and Construction Standards*, Shared Streets "limit motor vehicle traffic, and limit drivers to speeds that are no faster than a person can walk. Design elements like pavement material and entry features define the space."

The current width of the existing alley is approximately 9 m. All surface parking and loading stalls for the proposed development have been located along the north/south alley instead of the east/west alley to limit motor vehicle parking maneuvers in the east/west alley and support the potential for the east/west alley to be designed and constructed as a shared street through Garneau's Neighbourhood Renewal by. The east/west alley currently functions similar to a shared street with people walking, biking, and driving as well as service vehicles all sharing

the space and travelling at low speeds. Formalizing this design and providing a clear access route for individuals with reduced vision would improve the safety for all users.

Parking Provided in Proposed Development

The parking requirements for the proposed development is outlined based on Charter Bylaw 19275 – Text Amendments to Zoning Bylaw 12800 for Open Option Parking. The parking requirements specified in Charter Bylaw 19275 took effect on July 2, 2020. Based on Open Option Parking, the proposed development is required to provide accessible/barrier-free vehicle parking spaces, vehicle loading spaces, and bicycle parking spaces and allows the amount of off-street vehicle parking to be determined by the applicant. While the vehicle parking supply is determined by the applicant, vehicle parking supply must also be based on The Hive's proximity to the Transit Avenue along 109 Street and the associated maximum parking supply. Shared vehicle parking can also be included as part of the proposed development.

The Hive Resident Profile and Characteristics

Based on the type of units and location of the proposed development, the market for the future residents of the building will be a variety of demographics from students to young professionals to seniors. The applicant expects the majority of the future tenants will be familiar with the neighbourhood and will choose to live in the building due to its walkable, bikeable, and transit accessible location to serve work, school, and destinations that accommodate their daily needs. As such, the demand for vehicle parking will be low and residents will make the decision to live in The Hive knowing that owning a vehicle and parking will be possible, but will require purchasing a parking space, and that ample convenient transportation alternatives to driving are readily available. The travel patterns and need for parking of future residents of The Hive will likely be consistent with the current characteristics of neighbourhood residents and, due to de-coupled parking and increasing availability of attractive travel alternatives, the use motor vehicles may be even less.

Neighbourhood Characteristics

There has been significant investment in transportation options in the Garneau and Strathcona neighbourhoods in recent years. With Neighbourhood Renewal, the already walkable neighbourhoods are being further enhanced to improve connectivity and accessibility. Cycling infrastructure has been added along 83 Avenue and 106 Street, and further all ages and abilities bikeways are being added as part of Garneau and Strathcona Neighbourhood Renewal. Transit service along 109 Street is frequent and, with the implementation of the Bus Network Redesign, will become even more reliable and attractive. The LRT is also accessible from the University of Alberta station located on North Campus. The use of car share and e-scooter share is also popular and accessible in the Garneau and Strathcona neighbourhoods.

Travel behaviour of Garneau and Strathcona residents can be identified from the City of Edmonton's 2014 Census. While this data represents travel behaviours from before many of the above noted transportation options were available, the 2016 Census indicates more than 53% of Garneau residents' primary mode of transportation from home to work is transit, walking, or biking; this is an increase from the 38% identified in the 2014 Census. Based on the recent investments and increasing walking and cycling volumes along nearby pathways and bikeways (e.g., High Level Bridge, 83 Avenue, 106 Street), we believe the next Census will show a further shift to use of sustainable transportation modes and reduced use of motor vehicles.

On-street and Off-street Parking Supply and Use Characteristics

As noted earlier, unrestricted on-street parking is currently allowed along one side of both 108A Street and 86 Avenue, which allows people to park for as many hours as they would like. The site observations confirmed the low parking turnover for the current on-street parking spaces. As such, the availability of on-street parking for

residents or visitors of The Hive will be limited and will not be a likely option. Instead, visitors and residents to The Hive will need to use off-street vehicle parking or travel by foot, bike, or transit.

The Hive is located on land that currently operates as an off-street paid parking lot. The use of the lot is typically by staff and customers of the businesses along 109 Street on the west side of the North-South Alley that forms the western edge of the proposed development. This off-street parking space is well-used. The Hive will provide off-street, paid parking, similar to the operation that exists today and could be used by business staff and customers during the day and residents and visitors of The Hive at other times of the day. More information is included below related to shared vehicle parking.

The Hive Parking Supply

The design of the parking for The Hive will meet the dimension requirements outlined in the Zoning Bylaw for vehicle parking, accessible/barrier-free vehicle parking, vehicle loading spaces, and bicycle parking. The following provides a summary and assessment of the parking supply and the parking supply requirements for The Hive.

Vehicle Parking and Shared Parking

The proposed development will have 23 surface vehicle parking spaces and is currently considering providing 66 underground vehicle parking spaces for residents, for a total of 89 vehicle parking spaces. Based on the proposed residential unit mix, the maximum vehicle parking supply for The Hive is outlined in the below table due to the proposed development being located within 150m of a Transit Avenue. The proposed supply of vehicle parking of 89 is below 301 and meets the Zoning Bylaw maximum.

Table 8: Maximum Number of Vehicle Parking Spaces for Transit Avenue from the Zoning Bylaw

Unit Type	# of Proposed Units	Maximum Parking Rate	Maximum Parking Supply
Studio	90	1 Vehicle Parking Space / unit	90
1-Bedroom	129	1	129
2-Bedroom	38	1.5	57
3 or more Bedroom	14	1.75	25
TOTAL Maximum Vehicle Parking Supply			301

Based on the resident characteristics and associated market for The Hive, the applicant believes the vehicle parking supply of 66 underground spaces, which will be a combination of standard spaces and tandem spaces, will provide sufficient parking supply for residents in both smaller units and larger family-oriented units. In addition to the underground vehicle parking spaces, The Hive will also provide vehicle parking spaces accessible at-grade via access from the North-South Alley.

The 23 surface vehicle parking spaces will operate as shared parking. Similar to the existing off-street parking lot, the vehicle parking located along the alley and under The Hive will operate as shared parking with the adjacent businesses located on the west side of the North-South Alley. Through a private-to-private shared parking agreement, the surface parking spaces will be available for use by business staff during the day. Business customers will also be able to use the surface parking and it will likely operate as paid parking, consistent with the current operation of the surface parking lot. In the evenings, the surface vehicle parking will become available for visitors and guests of The Hive or for residents that may need a parking space overnight for a rental vehicle or another less frequent reason.

Based on the supply of vehicle parking proposed for the development, The Hive meets the vehicle parking requirements as outlined in the Zoning Bylaw.

Accessible/Barrier-Free Parking

The Zoning Bylaw specifies a process to calculate and determine the number of accessible vehicle parking spaces that are required based on the Alberta Building Code and taking into account the Open Option Parking requirements of the Zoning Bylaw.

Barrier-free parking (i.e., accessible parking) is determined by calculating the “Deemed Minimum Parking” per the Zoning Bylaw based on 0.8 parking spaces per dwelling unit (for multi-family housing). The Deemed Minimum Parking is then used to determine the number of required barrier-free parking spaces based on the Alberta Building Code requirements. Using the rate of 0.8 spaces per dwelling units, The Hive’s Deemed Minimum Parking is 216.8. From the Alberta Building Code, since there is more than 100 spaces based on the Deemed Minimum Parking number, there is a need for 4 barrier-free spaces plus 1 barrier-free space for every 100 spaces or fractions thereof. Based on this, The Hive needs to provide a total of 6 barrier-free vehicle parking spaces.

The Hive will be providing 6 accessible/barrier-free vehicle parking spaces in the underground parking structure, thereby meeting the Zoning Bylaw requirement. The accessible/barrier-free vehicle parking will also meet the necessary dimension and locational requirements for these spaces.

Bicycle Parking

The Zoning Bylaw requires 1 bicycle parking space per 2 dwelling units and at least 10% of the bicycle parking supply needs to be short term. Based on a total number of residential units of 271, The Hive is required to provide 136 bicycle parking spaces, 14 of which must be short term. The Hive will be providing a minimum of 185 long term bicycle parking spaces in a secure bicycle parking room within the underground parking structure. In addition, a minimum of 14 short term bicycle parking spaces will be provided to be accessible to visitors at-grade. The bicycle parking for The Hive meets the Zoning Bylaw requirements for the development.

Loading Spaces

On-site vehicle loading spaces for residential uses are intended to be designed to accommodate activities such as resident move-in/move-out and deliveries by larger vehicles. The use of the loading spaces at The Hive will be managed and will require scheduling by the property manager and/or residents. The Hive is providing 1 on-site vehicle loading space accessed via the North-South Alley. The precise design of this space and access/egress from the loading space will be further refined and details will be provided during the development permit phase of the development application process. While the Zoning Bylaw requires 2 loading spaces based on the maximum number of units that may be built, the active operation and management of the vehicle loading space, similar to booking an elevator for move-in/move-out, will allow for more efficient use of the loading space for The Hive due to scheduling. In addition, the surface vehicle parking spaces accessible from the alley will provide additional spaces for mail or courier deliveries. Based on the supply and operation, we believe The Hive will have sufficient capacity for the loading and delivery needs of the residents.

Also of note, like many residential towers in central Edmonton, the operation of waste pick-up will require garbage and recycling bins to be rolled into the alley from the adjacent room where they will be emptied by waste vehicles. This is a typical requirement for many residential and commercial towers and consistent with practices already followed by City of Edmonton and private waste collection services.

Transportation Demand Management Measures and Multimodal Mobility

Transportation Demand Management (TDM) is used to manage traffic and parking demands associated with an existing or proposed development. In the context of this study, TDM best practices and policies have been reviewed and discussed with the applicant to support management of parking demand from residents.

The location of the proposed development is in a neighbourhood with facilities which accommodate and promote walking and biking. High frequency transit service (i.e., eight buses per hour during peak periods) is also provided along 109 Street, and the redesigned bus network will provide similar or better frequency of service in the future. These factors and the anticipated characteristics of the residents based on the market for The Hive has led the applicant to provide the vehicle parking supply as described in previous sections.

In addition to the multimodal mobility characteristics available to future residents of The Hive, through discussion with the developer, all residential vehicle parking will be uncoupled from the residential units in the building. Uncoupling of the vehicle parking and requiring parking to be purchased separately from the residential unit supports more affordable housing and allows residents to determine for themselves if they need parking and make an informed decision about purchasing it. Based on best practice research, this approach will lead to reduced parking demands.

Conclusion

The above presents our assessment of the transportation and parking impacts for the proposed development of The Hive located in the Garneau neighbourhood on the west side of 108A Street. Based on the assessment, The Hive will have minor impacts on the operation and motor vehicle capacity of the adjacent streets that provide access to the site and the vehicle and bicycle parking supply meets the requirements outlined in the Zoning Bylaw.

Should you have any further questions, please contact the undersigned.

Sincerely,



Tyler Golly

TOOLE DESIGN

10160 103 Street NW | Edmonton, AB T5J 0X6

tgolly@tooledesign.com

Information contained in this document is for planning purposes and should not be used for final design of any project. All results, recommendations, concept drawings, and commentary contained herein are based on limited data and information, and on existing conditions that are subject to change. Further analysis and engineering design are necessary prior to implementing the recommendations contained herein.